

# FOREST RESEARCH NOTES

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## Observations Following Wildfire

### In A Young Stand Of Virginia Pine And Hardwoods

Fire has often been used as a silvicultural tool in managing most of the southern pines. At present, however, there is not enough evidence to show whether similar techniques can be used in Virginia pine stands. The purpose of this note is to offer some observations on how a wildfire affected a young pine-oak stand.

In November 1952, a hot surface fire ran through a 30-year-old pine-hardwood stand near Beltsville, Maryland. This fire started about 2 p.m. on a high-hazard day. The fire danger station readings were as follows: fuel moisture, 8 percent; wind, 15 m.p.h.; and burning index 65 (based on 100-point Fire Danger Meter 5-W). Thirty-five days had elapsed since the last rain of more than  $\frac{1}{4}$  inch. The fire was controlled after it had covered about 5 acres.

## Effects Of Fire Studied

In May 1953, four 1/20-acre plots were established, three in the burned-over area, and one in the adjacent unburned stand. A 100-percent inventory was made of all trees 0.5 inch d.b.h. and larger on each of the four sample plots.

A similar inventory was made in June 1954. Within each plot two permanent milacres were established. These milacres were purposely located to sample the best catch of pine reproduction on each plot so that subsequent survival counts could be made.

In March 1955, four temporary milacres were established at random in both the burned and unburned portions of the study area. These randomly selected milacres provided a rough estimate of the number of Virginia pine seedlings present on both areas 28 months after the fire.

Results to date show that this wildfire killed many trees. On the burned plots the original stand averaged



1,353 trees per acre. During the 2-year period following the fire, 613 (45 percent) of these trees died. Over half of the dead trees succumbed during the first year after the burn. However, most of the fire-killed hardwoods resprouted following the burn.

The stand on the unburned plot averaged 1,200 trees per acre. Mortality on this plot during the same 2-year period amounted to 15 percent of the original stand.

Approximately two-thirds of the total number of trees on all plots were in the 1- to 4-inch d.b.h. class. Ninety-six percent of the dead trees also occurred in this same diameter range.

#### More Seedlings In Burned Area

2 $\frac{1}{4}$  years after the fire there were 10,750 pine seedlings per acre on the burned area, but only 250 per acre on the unburned area. This seedling ratio of approximately 40 to 1 was found on both the temporary and permanent milacres. Most of these seedlings became established the second spring (1954) after an exceptionally good cone crop in 1953. Survival counts showed that the heaviest seedling mortality took place during the first few months after germination. All seedlings alive in November 1953 were still living in November 1954.

The large differences in seedling establishment between the burned and unburned plots may be due to several causes. Following the fire, the average depth of litter on the burned plots was 1.7 inches. On the unburned plot it was 2.3 inches. This reduction in litter depth, particularly of hardwood leaves, would make it easier for seed to get down to where moisture conditions are better. The fire also killed many small-sized trees. This caused a reduction in the amount of shade on the unburned plots. Also, some of the surface roots were probably killed.

All these factors improved conditions for better germination and survival of Virginia pine seedlings. Ultimate survival will depend upon the competition from both the remaining overstory and the prolific hardwood sprouts.

--THOMAS W. CHURCH, JR.

Virginia Pine-Hardwood Research Center  
Northeastern Forest Experiment Station  
Forest Service, U.S. Dept. Agriculture

Agriculture-Forest Service-Upper Darby